AN - 2001-593135 [67]

TI - Information processor e.g. computer, has naming bridge which starts server application using basic object adapter, when receiving transmission demand

AB - JP2001222514 NOVELTY - A client application acquires IOR of the naming bridge (12) from naming service (11) through portable telephone object request broker (31). The naming bridge starts a server application using a basic object adapter (21), when receiving a transmission demand. The server application receives the IOR and is self registered into the naming service.

- DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
- (a) Communication method;
- (b) Recording medium storing the information processing program
- USE - Information processor e.g. computer,
- ADVANTAGE - Even if the reference name solution service section and application server section are mutually different, an application server section can register into the reference name solution service section using common regulation standard.
- DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of computer system. (Drawing includes non-English language text).
- Naming service 11
- Naming bridge 12
- Basic object adapter 21
- Client object request broker 31
- (Dwg.1/6)

IW - INFORMATION PROCESSOR COMPUTER BRIDGE START SERVE APPLY BASIC OBJECT RECEIVE TRANSMISSION DEMAND

PN - JP2001222514 A 20010817 DW200167 G06F15/16 010pp

IC - G06F9/46 ;G06F15/16

MC - T01-M02

DC - T01

PA - (NITE) NTT COMMUNICATION WEAR KK

AP - JP20000034118 20000210

PR - JP20000034118 20000210

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the information processor in a computer system, the record medium which recorded the program, and a correspondence procedure. Especially, it is related with the information processor for the reference-name solution in communication between distributed objects, the record medium which recorded the program, and a correspondence procedure.

[0002]

[Description of the Prior Art] In recent years, use of distributed object technology is spreading in a computer system. One of the advantages using distributed object technology is by describing behavior of a system abstractly or using the parts-ized program to raise development of a system and the productivity of maintenance.

[0003] Moreover, since it becomes possible to build the system using open technology, without being dependent only on specific hardware or a specific software vender by using standard agreement, such as CORBA (Common Object Request Broker Architecture) defined by one side by OMG (Object Management Group), progress of distributed object technology is desired also from the field of adequate supply of system cost or a system component.

[0004] Thus, since it is one of the big advantages of distributed object technology for the system construction in a multi vendor environment to be possible, the attempt which interconnects the product of two or more venders in accordance with CORBA agreement is also performed.

[0005] One of the methods of abstraction of the system description in such distributed object technology has access to the server by the reference name. This is realized by preparing in a system the reference-name solution service which passes the above information to a client program based on a reference name, even if a client program does not know beforehand the information (an IP address, a host name, a process ID, process occurrence time, etc.) for accessing a server program.

[0006]

[Problem(s) to be Solved by the Invention] One of the troubles in the conventional technology suited that the initialization processing for using the above reference-name solution services was not defined in common agreement. Since the mounting method for acquiring own access information of reference-name solution service was not more specifically defined as common agreement, this information needed to be acquired using the means mounted by different method for every vender, or access information needed to be exchanged using a certain means of the aforementioned common agreement out of range.

'0007] Moreover, although it is desirable to have the mechanism in which a server program can be started iutomatically when a server program has the demand to the server program from a client program in the itate where it does not start, since there is no definition in common agreement also about such a nechanism, mounting is made by different method for every vender. Therefore, it was not guaranteed that he auto-boot of a server program is realizable as it is using the product of two or more different venders.

0008] Drawing 6 is the block diagram showing the system configuration by the conventional technology. Vhen all the components shown in drawing 6 use the CORBA product by the same vender, naming ervice 11 can receive the demand by the reference name from a client (Object Request Broker) ORB 31, an solve the reference name with reference to the information registered beforehand, and can return the

Client ORB. Moreover, server application can be automatically started by generating the object implementation 23 through BOA (Basic Object Adapter)21.

[0009] However, since a server ORB 41 cannot acquire the access information on naming service 11 and server application cannot be registered into naming service 11, in different mounting by the vender from which a server ORB 41 and naming service 11 differ, for example, client application cannot communicate with server application based on a reference name, and cannot receive service in it.

[0010] When it was going to build a system conventionally by the above problems using CORBA common agreement, it cannot but be necessary to unify with the product of a single vender or, and the special structure of common agreement out of range was built, it will be necessary to deliver access information, and there was a situation that the merit of open technical use was fully unenjoyable as a result.

[0011] When this invention can be made in view of the above situations, a reference name can be solved only in conformity with common agreement even if it uses the component based on two or more different mounting methods which have adopted common agreement, communication during a program can be performed and a server program has not been started, it aims at offering the information processor which can start automatically, the record medium which recorded the program, and a correspondence procedure.

[0012]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the information processor by this invention The access information on this application server section by which the client section is registered into the reference-name solution service section based on the reference name of the application server section is acquired. In the computer system which communicates with the aforementioned application server section using this access information The 1st processing which acquires the access information on the aforementioned reference-name solution service section, The 2nd processing which registers the access information on self into the aforementioned reference-name solution service section using the access information acquired by this 1st processing, The 3rd processing which receives the demand accompanied by the aforementioned reference name from the aforementioned client section, As opposed to the application server section according to the aforementioned reference name which received by this 3rd processing The 4th processing which passes the access information acquired in the 1st aforementioned processing, and directs the registration to the reference-name solution service section, It is characterized by having the initial interface section of reference-name solution which performs 5th processing which notifies completion of the registration in this 4th processing to the aforementioned client section of a requiring agency.

[0013] Here, a reference name is a name used in order to conceal and abstract information, such as the information about the concrete access method to the application server section, i.e., the communication address of the application server section, (for example, IP address), a host name, a program name, a process ID, and occurrence time. Moreover, the reference-name solution service section determines the concrete access information according to the system environment under operation based on the demanded reference name, and has the role with which a requiring agency is provided.

[0014] By the above composition of this invention, since the basic protocol [section / reference-name solution service / the application server section and] mounting methods differ mutually When the application server section cannot register self into the reference-name solution service section only with the interface set to the protocol The client section requires solution of a reference name through the initial interface section of reference-name solution, and it enables the application server section to register self into he reference-name solution service section by using the information which this initial interface section of eference-name solution offers. Also in the environment where the mounting method that plurality differs is ntermingled by this, the program created using each mounting method can use now the function of the eference-name solution service section.

0015] Moreover, since the newest information is always registered by making the demand from the client ection into a trigger when the reference-name solution service section does not maintain a context by the bove composition (i.e., when not continuing holding the access information on the application server ection registered before), the client section becomes possible [surely receiving service of reference-name olution].

)016] Moreover, in the information processor by this invention, the reference name of the application erver section is received, when the aforementioned application server section corresponding to this started, it has the object application section which starts the application server section, and as for the aforementioned initial interface section of reference-name solution, it is desirable to require starting of the aforementioned application server section corresponding to this reference name from the aforementioned object application section using the aforementioned reference name which received in the 3rd aforementioned processing.

[0017] When it is a demand point from the client section and the application server section is not beforehand started by such composition of this invention, it becomes possible to start the application server section automatically and to continue processing, and the employment ease of a computer system improves.

[0018] Moreover, this invention acquires the access information on this application server section by which the client section is registered into the reference-name solution service section based on the reference name of the application server section. In the computer system which communicates with the aforementioned application server section using this access information The 1st processing which acquires the access information on the aforementioned reference-name solution service section, The 2nd processing which registers the access information on self into the aforementioned reference-name solution service section using the access information acquired by this 1st processing, The 3rd processing which receives the demand accompanied by the aforementioned reference name from the aforementioned client section, As opposed to the aforementioned application server section according to the aforementioned reference name which received by this 3rd processing The 4th processing which passes the access information acquired in the 1st aforementioned processing, and directs the registration to the reference-name solution service section, Let the record medium which recorded the program characterized by making a computer perform 5th processing which notifies completion of the registration in this 4th processing to the aforementioned client section of a requiring agency and in which computer reading is possible be a summary.

[0019] By such composition of this invention, since the basic protocol [section / reference-name solution service / the application server section and] mounting methods differ mutually When the application server section cannot register self into the reference-name solution service section only with the interface set to the protocol It becomes possible to perform processing which offers the access information on the reference-name solution service section to the application server section corresponding to the demand based on the demand from the client section. The application server section becomes possible [registering self into the reference-name solution service section] using the access information.

[0020] Moreover, in the 4th aforementioned processing, when the aforementioned application server section according to the aforementioned reference name has not been started, as for the record medium by this invention in which computer reading is possible, it is desirable to record the program characterized by making a computer perform processing which starts the application server section.

[0021] When the application server section is not beforehand started by such composition of this invention, it becomes possible to start the application server section automatically and to continue processing.

[0022] Moreover, the correspondence procedure by this invention acquires the access information on this application server section by which the client section is registered into the reference-name solution service section based on the reference name of the application server section. In the computer system which communicates with the aforementioned application server section using this access information The 1st process in which the initial interface section of reference-name solution acquires the access information on the aforementioned reference-name solution service section, The 2nd process in which the aforementioned initial interface section of reference-name solution registers the access information on this initial interface section of reference-name solution into the aforementioned reference-name solution service section using the aforementioned access information acquired in this 1st process, The 3rd process in which the aforementioned initial interface section of reference-name solution passes the access information on the aforementioned reference-name solution service section to the application server section according to the aforementioned reference name based on the demand accompanied by the aforementioned reference name from the aforementioned client section, The 4th process in which the aforementioned application server section registers the access information on this application server section into the aforementioned reference-name solution service section using the access information passed in this 3rd process, The aforementioned reference-name solution service section passes the access information on the aforementioned application server section registered in this 4th process to the aforementioned client section. It is characterized by having the 5th process in which the aforementioned client section communicates with the aforementioned based on the aforementioned agreement using the access information acquired here.

[0023] By such composition of this invention, since the basic protocol [section / reference-name solution service / the application server section and] mounting methods differ mutually When the application server section cannot register self into the reference-name solution service section only with the interface set to the protocol The client section requires solution of a reference name through the initial interface section of reference-name solution, and it enables the application server section to register self into the reference-name solution service section by using the information which this initial interface section of reference-name solution offers.

[0024] Moreover, since the newest information is always registered when the reference-name solution service section does not maintain a context by the above composition, the client section becomes possible [surely receiving service of reference-name solution].

[0025] Moreover, in the correspondence procedure by this invention, in the 3rd process of the above, when the aforementioned application server section according to the aforementioned reference name has not been started, it is desirable to start the application server section automatically.

[0026] When the application server section is not beforehand started by such composition of this invention, it becomes possible to start the application server section automatically and to continue processing.

[0027]

[Embodiments of the Invention] Hereafter, 1 operation gestalt of this invention is explained with reference to a drawing. Drawing 5 is a system configuration view in which this invention shows an example of premised system environment. In the composition shown in drawing 5 , the application program described by ORB (Object Request Broker) and C++ language by mounting (it is called Mounting A) which is a server side computer works. Moreover, the client side computer is connected with the server side computer in the network, and the application program described in ORB and the Java language by different mounting B from the above-mentioned mounting A works.

[0028] Drawing 1 is the block diagram showing the structure of a system which realizes naming service by CORBA agreement etc. using the product by two or more mounting methods. In drawing 1 , the client ORB using the product according [a sign 31] to Mounting B and 41 are the servers ORB using the product by Mounting A.

[0029] Moreover, it is the naming bridge (initial interface section of reference-name solution) in which 11 was prepared in order that the naming service (reference-name solution service section) using the product by Mounting B and 12 might conceal the difference during different mounting. Moreover, implementation RIPOJITORI holding information required in order that BOA (Basic Object Adapter, object application section) to which each of 21-23 is based on Mounting A, and 21 receives the demand from a client, and 22 may start the server program corresponding to the demanded service, and 23 are object implementations generated corresponding to the demanded service.

[0030] In addition, IIOP (Internet Inter-ORB Protocol) is used for communication between ORB here.

[0031] Next, a procedure until it solves a reference name and application programs can start communication focusing on an operation of the naming bridge 12 prepared as a function to mediate both in the environment where the above mounting A and B is intermingled is explained.

[0032] Drawing 2 is the programs communication sequence diagram showing a procedure until use of naming service 11 is attained from system during starting. As shown in drawing 2 , CORBA demon starting shell is first performed by system during starting, and this CORBA demon starting shell starts BOA21, implementation RIPOJITORI 22, and the naming bridge 12 one by one.

[0033] The naming bridge 12 started by CORBA demon starting shell starts naming service 11 first, and acquires IOR (Interoperable Object Reference) access information) of naming service 11. IOR includes information required for access to the server program which offers service, and, specifically, is compound nformation which consists of an IP address, a host name, a process ID, process occurrence time, etc. here.

0034] In this example, it realizes as a process on UNIX, and the naming bridge 12 can start naming ervice 11 via shell, and the naming bridge 12 and naming service 11 can acquire the IOR by catching the ontents of the standard output of naming service 11. Once acquiring IOR, it can communicate with aming service 11 using this information on IOR.

0035] Then, it is required that the naming bridge 12 should register self information to naming service 11.

registration, client application will be in the state where service of the naming bridge 12 can be received through naming service 11.

[0036] Next, the procedure for communicating with the server application 52 (application server section) based on the demand which the client application 51 (client section) advances is explained. Drawing 3 is the programs communication sequence diagram showing a procedure until it acquires IOR of the server application 52 corresponding to the reference name, after the client application 51 advances the demand by the reference name.

[0037] Since the same mounting B as naming service 11 is realized, the client application 51 can acquire IOR of the naming bridge 12 by the function which naming service 11 offers, after performing the function call for initialization of naming service 11 "resolve_initial_references("NamingService");."

[0038] After acquiring this IOR, the client application 51 specifies the reference name of the service with the server application 52 first demanded for connection, and publishes a prior demand to the naming bridge 12. The naming bridge 12 which received this prior demand publishes a connection request using the reference name which received. When the corresponding server application 52 has not started, the server application 52 is started through BOA21 and implementation RIPOJITORI 22. When the server application 52 is already started, a notice to that effect is returned to the naming bridge 12 from BOA21. In addition, the naming bridge 12 accesses BOA21 with the interface of the standard defined as CORBA here.

[0039] After that, the naming bridge 12 directs the registration to the naming service 11 of the server application 52 while passing IOR of the already acquired naming service 11 to the server application 52. In response to it, the server application 52 registers self into naming service using IOR of the passed naming service 11 (rebind). And registration of completion returns the information on to that effect to the naming bridge 12. Moreover, the naming bridge 12 notifies completion of the registration to the naming service 11 of the server application 52 to the client application 51.

[0040] Since the server application 52 is already registered into naming service 11 when this notice is received, the client application 51 requires solution of a reference name naming service 11, and acquires IOR of the server application 52 which corresponds from naming service 11.

[0041] Thus, the client application 51 will be in the state where communication with the server application 52 can be performed using acquired IOR.

[0042] In addition, to the construction person of client application, the detail of two steps of such processings is concealed, and you may make it not make it conscious by realizing issue of a prior demand, and issue of the reference-name solution demand to the naming service 11 to the naming bridge 12 in the client application 51 as a function of one function.

[0043] In the above environment shown in drawing 1 , since the server ORB 41 is realized by Mounting A, the server application which offers service to a client through this server ORB 41 cannot acquire IOR of the naming service 11 realized by Mounting B by the usual method. However, it is possible for the server application 52 to register self into naming service 11, and for the client application 51 to solve a reference name by naming service 11, and to acquire IOR of the server application 52 via this naming bridge 12, with the procedure which formed the naming bridge 12 in this operation form, and was shown by drawing 2 and drawing 3 .

[0044] Moreover, only the interface to naming service is not specified in CORBA, and the functional detail is not necessarily specified completely. Therefore, since mounting of naming service which does not maintain a former context to during starting is also effective, the product mounted such also exists. Since the server application 52 will register self into naming service 11 after generating of the demand from the client application 51 by following the procedure shown in drawing 2 and drawing 3 when the program of such naming service is used, the same effect as the case where the context of naming service is maintained can be acquired.

[0045] Next, the sequence of an exchange of the information between each system component after a system is started until communication between client/server is attained is explained. Drawing 4 is the collaboration view showing the exchange of the information between structure-of-a-system elements. In addition, the sequence numbers 1-2 shown in drawing 4 are equivalent to the procedure shown in drawing 2 , and, similarly sequence numbers 7-12 are equivalent to the procedure shown in drawing 3 .

[0046] BOA21, implementation RIPOJITORI 22, and the naming bridge 12 are first started automatically by system during starting.

, the naming bridge 12 starts naming service 11, and acquires IOR of naming service 11.

[0048] Next, in a sequence 2, the naming bridge 12 registers self into naming service 11 using IOR acquired in the sequence 1.

[0049] Next, in a sequence 3, the client application 51 requests solution of the reference name of the naming bridge 12 from naming service 11, and acquires IOR of the naming bridge 12 as the result.

[0050] Next, in a sequence 4, the client application 51 accesses the naming bridge 12 using IOR acquired in the sequence 3, and requires a server list (list information on a server).

[0051] Next, in a sequence 5, the naming bridge 12 acquires the list information on the instance of an object from BOA21.

[0052] Next, in a sequence 6, the naming bridge 12 builds a server list using the instance list acquired in the sequence 5. The client application 51 becomes possible [performing application processing called the display of the list menu of the service which can be used etc.] by acquiring the server list created in the procedure of sequences 4-6, using this information.

[0053] Next, in a sequence 7, the client application 51 publishes the prior connection request to a server to the naming bridge 12.

[0054] Next, in a sequence 8, the naming bridge 12 requires connection with the server application 52 from BOA21 based on the reference name which received in the sequence 7. In this example, the demanded server application 52 shall not be started yet.

[0055] Next, in a sequence 9, BOA21 requires starting of the server application 52 from implementation RIPOJITORI 22 based on the demand from the naming bridge 12 in a sequence 8.

[0056] Next, in a sequence 10, implementation RIPOJITORI 22 starts the application server 52 corresponding to the demand received by the sequence 9.

[0057] Next, in a sequence 11, the server application 52 started by the sequence 10 registers self into naming service 11 using IOR of the naming service 11 passed from the naming bridge 12. Completion of this registration is notified to server application 52- implementation RIPOJITORI 22-BOA21 the naming bridge 12 - the client application 51 one by one as an answer of an old demand.

[0058] Next, in a sequence 12, using the same reference name as the time of the prior demand in a sequence 7, the client application 51 requests solution of a reference name from naming service 11, and acquires IOR of the server application 52.

[0059] Finally, in a sequence 13, the client application 51 starts communication with the server application 52 using IOR acquired by the sequence 12.

[0060] In addition, the program which recorded on the medium which can computer read the program for realizing each function, and was recorded on this medium is made to read into a computer system, and the naming service 11 and the naming bridge 12 which were explained in the top, BOA21, implementation RIPOJITORI 22, a client ORB 31, a server ORB 41, the client application 51, and the server application 52 may be made to execute it.

[0061] In addition, "the record medium in which computer reading is possible" here means storage, such as a hard disk in media, such as a floppy disk, a magneto-optic disk, ROM, and CD-ROM, and a computer system. Furthermore, what holds a fixed time program at least shall be included ["whose record medium in which computer reading is possible" is] like the volatile memory inside a computer system in case a program is transmitted through a telecommunication circuit (semiconductor read/write memory).

[0062] Moreover, the above-mentioned program may be transmitted to other computer systems through the transmission medium of a telecommunication circuit from the computer system which stored this program in storage etc. The transmission medium of a telecommunication circuit means a cable, electromagnetic field, etc. with the physical property which tells the signal by the electrical and electric equipment or the electromagnetic wave here.

0063] Moreover, the above-mentioned program may realize a part of function mentioned above. urthermore, what can realize the function mentioned above in combination with the program already ecorded on the computer system and the so-called difference -- you may be a program

0064] Moreover, processing of these programs may be performed on the same computer, and may be erformed on a different computer. Moreover, processing of each above-mentioned program may be erformed ranging over two or more computers. When processing is performed on two or more computers, performing communication which minded the network among these computers if needed.

[0065] Moreover, although the naming bridge 12 and naming service 11 shall be realized as a process on UNIX and the naming bridge 12 shall start naming service 11 via shell in the above-mentioned example, you may make it the naming bridge 12 acquire IOR of naming service 11 by the method for which these programs worked on other OS's (operating system), and it was suitable according to the OS.

[0066] Moreover, although drawing 5 showed as an example the case where the application by the side of a server was described by C++ language, and the application of a client side was described by the Java language, each application may be described by the language except having illustrated, and, also in such a case, can apply this invention.

[0067] Moreover, in the above-mentioned example, the naming bridge 12, BOA21, implementation RIPOJITORI 22, the object implementation 23, a server ORB 41, and the server application 52 are based on Mounting A, and naming service 11, a client ORB 31, and client application 51 are realized based on Mounting B. However, application of this invention may be the combination of other patterns from which it is not limited to the system of such a combination, but the client application 51 can acquire IOR of naming service 11 by initialization processing. Moreover, it is not limited to two kinds of Mounting A and B, but this invention may be applied to the environment where three or more kinds of mounting is intermingled.

[0068]

[Effect of the Invention] Since according to this invention the initial interface section of reference-name solution is prepared and this initial interface section of reference-name solution is passing the access information on the reference-name solution service section to the application server section, as explained above, even if mounting with the reference-name solution service section and the application server section differs, the application server section can be registered to the reference-name solution service section only using the service defined by standard common agreement.

[0069] Moreover, after prior requiring from the client section, in order that the application server section may register self into the reference-name solution service section, when using the reference-name solution service section currently made so that a context may not be maintained according to this invention, the *** * situation of whether the application server section is registered from before is made in false, and by the reference-name solution service section, the client section can solve a reference name and can perform communication with the application server section.

[0070] Moreover, in order that the initial interface section of reference-name solution may publish a server activate request by the method adjusted in mounting of BOA according to this invention, also in the situation that the application server section is not beforehand started from the client section to a demand, it becomes possible to start the application server section dynamically.

[0071] Since it becomes possible to build a computer system by making into a component the product which two or more venders of different mounting by realizing these structure with the application of this invention offer, it becomes possible to attain reduction-izing of cost, and stabilization of supply of a component.

[Translation done.]